Bellwork: Period 1 - 10/2/12

Find the equation of the line that goes through the points (-5,-1) and (-15,1)

x_1, y_1 $\quad$ x_2, y_2

$$m = \frac{1 + 1}{-15 + 5} = \frac{2}{-10} = -\frac{1}{5}$$

$$y - 1 = -\frac{1}{5}(x + 15) \quad \text{or} \quad y + 1 = -\frac{1}{5}(x + 5)$$

$$y - 1 = -\frac{1}{5}x - 3 \qquad y + 1 = -\frac{1}{5}x - 1$$

$$+1 \qquad +1 \qquad -1 \qquad -1$$

$$\boxed{y = -\frac{1}{5}x - 2} \qquad \boxed{y = -\frac{1}{5}x - 2}$$

① $(\overset{x_1}{6}, \overset{y_1}{6})$ and $(\overset{x_2}{10}, \overset{y_2}{4})$

$$m = \frac{4-6}{10-6} = \frac{-2}{4} = -\frac{1}{2}$$

$$y - 6 = -\frac{1}{2}(x-6)$$

$$y - 6 = -\frac{1}{2}x + 3$$

$$+6 \qquad +6$$

$$\boxed{y = -\frac{1}{2}x + 9}$$

⑥ $(-5, -3)$ and $(10, 2)$

$$m = \frac{2+3}{10+5} = \frac{5}{15} = \frac{1}{3}$$

$$y - 2 = \frac{1}{3}(x - 10)$$

$$y - 2 = \frac{1}{3}x - \frac{10}{3} + \frac{6}{3}$$

$$+2 \quad +2$$

$$\boxed{y = \frac{1}{3}x - \frac{4}{3}}$$

(12) $(4,1)$ and $(-8,4)$

$$m = \frac{4-1}{-8-4} = \frac{3}{-12} = -\frac{1}{4}$$

$$y - 1 = -\frac{1}{4}(x-4)$$

$$y - 1 = -\frac{1}{4}x + 1$$

$$+1 \qquad\qquad +1$$

$$\boxed{y = -\frac{1}{4}x + 2}$$

Parallel lines: lines that do not intersect because they have the same slope

Write the equation of the line that is parallel to $y = 6x - 2$ through $(1, -3)$.

x_1 y_1

parallel → same slope

$m = 6$

pt: $(1, -3)$

$y - y_1 = m(x - x_1)$

$y + 3 = 6(x - 1)$

$y + 3 = 6x - 6$

$-3 \quad -3$

$y = 6x - 9$

parallel to $4x + 2y = 7$ through $(4, -2)$

same slope

* not answer

$\frac{2y}{2} = \frac{-4x}{2} + \frac{7}{2}$

$y = -2x + \frac{7}{2}$

$m = -2$

$pt: (4, -2)$

$y + 2 = -2(x - 4)$

$y + 2 = -2x + 8$

$-2 \quad -2$

$y = -2x + 6$

parallel to $2x - 3y = 9$ through $(-6, -1)$

$-2x \quad -2x$

$\frac{-3y}{-3} = \frac{-2x}{-3} + \frac{9}{-3}$

$y = \frac{2}{3}x - 3$

$m = \frac{2}{3}$

pt $(-6, -1)$

$y + 1 = \frac{2}{3}(x + 6)$

$y + 1 = \frac{2}{3}x + 4$

$-1 \quad -1$

$y = \frac{2}{3}x + 3$

Perpendicular lines: lines that intersect at 90°; slopes are opposite reciprocals (flip sign | flip fraction)

Write the equation of the line that is

(a) perpendicular to $y = -4x + 7$ through $(8, 5)$

opp. reciprocals $\quad -\frac{4}{1} \rightarrow \frac{1}{4}$

$m = \frac{1}{4}$

pt: $(8, 5)$

$y - 5 = \frac{1}{4}(x - 8)$

$y - 5 = \frac{1}{4}x - 2$

$+5 \quad +5$

$y = \frac{1}{4}x + 3$

(b) Perpendicular to $y = \frac{2}{3}x - 1$ through $(0, 6)$

opp. reciprocal $\quad \frac{2}{3} \rightarrow \frac{-3}{2}$

$m = \frac{-3}{2}$

$pt = (0, 6)$

$y - 6 = \frac{-3}{2}(x - 0)$

$y - 6 = \frac{-3}{2}x + 0$

$+6 \qquad\qquad +6$

$$y = \frac{-3}{2}x + 6$$

HW:

Equations of Lines Review - all